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Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Canceled).
2. (Currently Amended) The system of claim 21 wherein said light source is a tunable diode laser.
3. (Currently Amended) The system of claim 21 wherein said light source is a color center laser.
4. (Currently Amended) The system of claim 21 wherein said light source is a quantum cascade laser.
5. (Currently Amended) The system of claim 21 wherein said detector is an InGaAs detector.
6. (Currently Amended) The system of claim 21 further comprising means for calibrating the optical sensor system relative to a known concentration of water vapor within the natural gas.

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7. (Currently Amended) The system of claim 21 wherein the light source operates substantially at a wavelength within the range of 1.877-1.901 μm .

8. (Currently Amended) The system of claim 21 wherein the light source operates substantially at a wavelength selected from a group comprising: 2.711-2.786 μm .

9. (Currently Amended) The system of claim 21 wherein the light source operates substantially at a wavelength within the range of 920 to 960 nm.

10-20. (Canceled).

21. (Previously Presented) A system comprising:

at least one chemical sensor to detect a level of water vapor in natural gas;

at least one optical sensor to detect a level of water vapor in natural gas, the optical sensor comprising:

a light source emitting light at substantially a single wavelength having a width sufficiently narrow to conduct single line spectroscopy and corresponding to a single absorption line at which water molecules absorb light at a substantially greater level than natural gas molecules;

a detector configured to detect the intensity of light emitted from said light source;

and

electronics coupled to said detector for determining the level of water vapor in the natural gas using single line harmonic spectroscopy; and

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a supply line delivering natural gas to the at least one chemical sensor and the at least one optical sensor for parallel measurements.

22. (New) The system of claim 21 wherein said light source is a VCSEL laser.

23. (New) A system comprising:

means for chemically detecting a level of water vapor in natural gas;

means for optically detecting a level of water vapor in natural gas, the means for optically detecting a level of water vapor in natural gas comprising:

means for emitting light at substantially a single wavelength having a width sufficiently narrow to conduct single line spectroscopy and corresponding to a single absorption line at which water molecules absorb light at a substantially greater level than natural gas molecules;

means for detecting an intensity of light emitted from said means for emitting light;

and

calculation means for determining the level of water vapor in the natural gas using single line spectroscopy; and

a supply line delivering natural gas to the at least one chemical sensor and the at least one optical sensor for parallel measurements.

24. (New) The system of claim 23 wherein said means for emitting light comprises a tunable diode laser.

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25. (New) The system of claim 23 wherein said means for emitting light comprises a color center laser.

26. (New) The system of claim 23 wherein said means for emitting light comprises a quantum cascade laser.

27. (New) The system of claim 23 wherein said means for emitting light comprises a VCSEL laser.

28. (New) The system of claim 23 wherein said means for detecting comprises an InGaAs detector.

29. (New) The system of claim 23 further comprising means for calibrating the means for optically detecting a level of water vapor in natural gas relative to a known concentration of water vapor within the natural gas.

30. (New) The system of claim 23 wherein said means for emitting light operates substantially at a wavelength within the range of 1.877-1.901 μm .

31. (New) The system of claim 21 wherein said means for emitting light operates substantially at a wavelength selected from a group comprising: 2.711-2.786 μm .

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32. (New) The system of claim 23 wherein said means for emitting light operates substantially at a wavelength within the range of 920 to 960 nm.

33. (New) A system comprising: and
a chemical sensor to detect a level of water vapor in natural gas mounted in parallel to the optical sensors; means for optically detecting a level of water vapor in natural gas, the means for optically detecting a level of water vapor in natural gas comprising:
means for emitting light at substantially a single wavelength having a width sufficiently narrow to conduct single line spectroscopy and corresponding to a single absorption line at which water molecules absorb light at a substantially greater level than natural gas molecules;
means for detecting an intensity of light emitted from said means for emitting light;
and
calculation means for determining the level of water vapor in the natural gas using single line spectroscopy;

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